splash!

quick facts on…
LILA
An Everglades Living Laboratory

MARCH 2016

The South Florida Water Management District is a regional governmental agency that manages the water resources in the southern part of the state. It is the oldest and largest of the state's five water management districts.

Our Mission is to manage and protect water resources of the region by balancing and improving flood control, water supply, water quality and natural systems.

The science behind Everglades restoration is keeping researchers busy at a unique outdoor laboratory: the Loxahatchee Impoundment Landscape Assessment (LILA) in Boynton Beach, Florida.

LILA is a working 80-acre model of the Everglades ecosystem on the grounds of the Arthur R. Marshall Loxahatchee National Wildlife Refuge. This "living laboratory" gives experts an opportunity to research and apply restoration techniques on a small, controlled scale before taking them into the 1.7 million-acre Everglades ecosystem. The unique facility was built in 2003 as a partnership between the South Florida Water Management District, U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers.

Water control is at the heart of LILA, where an electric pump capable of moving more than 45,000 gallons of water (the volume of two swimming pools) per minute can simulate a variety of natural conditions in four enclosed marshes. Each of the 20-acre "macrocosms" simulates various landscape conditions and contains three key habitats found in the natural Everglades system:

- Tree islands – the highest points in the Everglades marsh. These slightly raised "islands" provide drier habitats across the vast wetland. Tree islands support woody vegetation and are critical to wildlife survival.

- Ridges – long, slightly elevated sections of the marsh landscape that are dominated by sawgrass. Ridges are too wet for tree species.


The tree islands in LILA provide a site for intensive research into the function of tree islands within the Everglades landscape.

- Sloughs – lowest in elevation, they are like streams within the marsh. Sloughs contain water lilies and submerged aquatic plants.

At LILA, water depths and flows in each macrocosm can be controlled independently so that scientists can study the effects on the system. Data from these studies help researchers develop recommendations for improving water management (depths, flows, timing) in the Everglades ecosystem.

Research at LILA remains crucial to Everglades restoration success. Studies have included:

- Drought – Using the hydrologic control available at LILA, scientists created drought conditions by draining two of LILA's macrocosms and maintaining average water levels in the remaining two. Researchers were then able to measure how the responses of the wildlife differed between the two conditions. This work allows water managers to better predict how wildlife, such as wading birds and their prey, react to droughts that naturally occur within the Everglades.

- Tree islands – Long term studies are needed to understand tree island ecology at LILA. Studies have utilized the tree islands (constructed within the macrocosms) in order to understand the link between water depths and flooding regime on these critical Everglades habitats. Scientists study relationships between groundwater and surface water, tree survival and growth and soil building and erosion. Scientists have built an enhanced understanding of how changes in hydrology effect these processes important to maintaining and restoring natural tree islands.

- Fish tagging – How fish and other aquatic animals respond to changes to water depths across the Everglades landscapes is critical to understanding how keystone species, like wading birds and alligators thrive within the Everglades. Historically, the Everglades was known to support healthy populations of these animals despite low nutrient inputs and variable water conditions. Scientists at LILA use many high-tech methods to monitor the behavioral response of fish and other prey items to both average and extreme hydrological conditions, including passive radio tags and active radio tracking. This information is input into predictive computer models that help water managers understand how wildlife are reacting to water conditions in the greater Everglades landscapes.
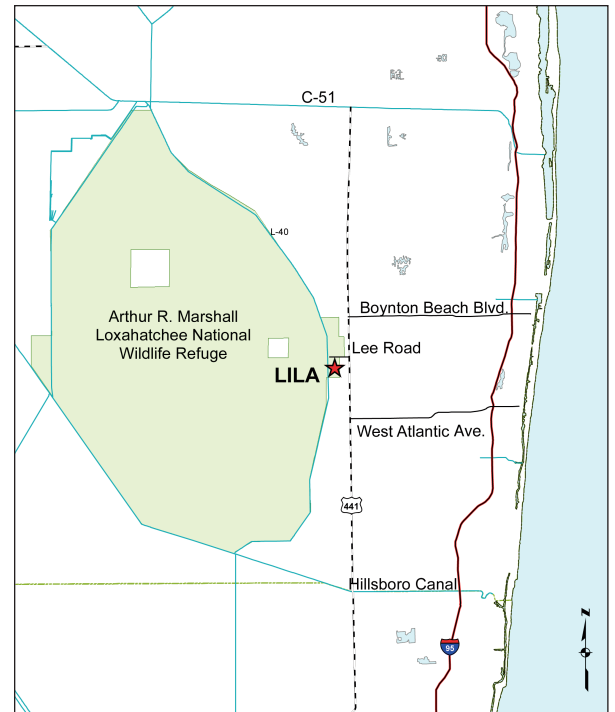
LILA (Loxahatchee Impoundment Landscape Assessment) at the Arthur R. Marshall Loxahatchee National Wildlife Refuge

Visitors to the Arthur R. Marshall Loxahatchee National Wildlife Refuge will find LILA located on the marsh trail. Visiting LILA provides an opportunity to spend a morning watching a flock of wading birds. At the same time, scientists are collecting valuable information that will ultimately be used to restore the Everglades.

A researcher uses sophisticated instrumentation to measure carbon cycling of the soil on a LILA tree island.